THE IDENTITY OF *ALOE ABYSSINICA* LAMARCK, *A. ELEGANS* TODARO AND *A. CAMPERI* SCHWEINFURTH.

By G. W. Reynolds.

(With Plates XXIX—XXXV.)

Aloe abyssinica Lamarck

Aloe abyssinica Lamarck was described in *Encyclopédie Méthodique* 1: 86 (1783) Paris. The description includes, (from the French): "Leaves 2½ feet long, 4 ins. broad at base, thick, with red marginal spines, convex on the outside, channelled on the inner face. Peduncle simple, up to 3 feet or more, with yellowish-green flowers disposed in a long somewhat lax spike. Flowers deeply cut into 6 parts, stamens protruding a little from the corolla and grouped together against one side."

Lamarck states, "This plant was brought back from Africa by Bruce and is growing in the King's Garden." (Paris).

The intrepid traveller James Bruce (b. 1730, d. 1794) landed at Massawa, the Red Sea Port of Eritrea, on 19 September 1769. He travelled southwards through Arkiko, and crossed the Taranta Mountain to Dixan. After crossing the Belesa River—a tributary of the Mareb—he reached Adowa on 5 December. Bruce then went to Axum and continued south-westwards to Gondar. After discovering the source of the Blue Nile, he left Gondar on 26 September 1771 and journeyed westwards to Sennar in the Sudan, then up to Shendi, and reached Cairo on 27 December 1772—three years and three months after landing at Massawa. Bruce had spent two years between Massawa and Gondar, which is country very rich in Aloe, and he took fifteen months from Gondar to Cairo. No Aloe has hitherto been recorded from the Sudan part of his journeys.

It seems therefore, that Bruce possibly collected his plant somewhere between Massawa and Gondar, between September 1769 and September 1771. Bruce might have sent the plant to Paris from somewhere in Eritrea or Tigre, but if he literally "brought back" the plant from Africa, as Lamarck clearly states, then he must have carried it with him for at least more than a year—which seems unlikely—unless he picked up a cultivated plant in Cairo or Alexandria, which now seems a possibility.

During my own recent and extensive travels in Eritrea and Tigre (Northern Ethiopia), I traversed several areas that Bruce had travelled through, but I sought in vain for an Aloe fitting Lamarck's description of *A. abyssinica*. I had borne in mind Salm Dyck's figure of "*A. abyssinica*" in his *Monogr. gen. Aloe* sect. 18, fig. 1 (1842), and also Berger's figures and account in Engler *Pflanzenr.* Liliac.-Aloin 237 (1908). These accounts were of two different species, and neither agreed with Lamarck's description.

Two species that I found in considerable numbers in Eritrea and Tigre were *A. Camperi* Schweinfurth (=*A. eru* Berger—see below), and *A. elegans* Todaro (=*A. aethiopica* (Schweinf.) Berger—see below), with *A. trichosantha* Berger, and *A. macrocarpa* Tod. in lesser numbers. Bruce must surely have seen these species, but not one of them fits Lamarck's description. *A. Camperi* agrees in channelled recurved leaves, but the inflorescence is a many-branched panicle and never bears racemes with "yellow flowers arranged in a long somewhat lax spike."

On reaching Addis Ababa I received a photograph from Professor J. Millot of the specimen named *A. abyssinica* by Lamarck himself in the Lamarck Herbarium, housed in the Natural History Museum, Paris.

This photograph is reproduced herein (Plate XXIX.) and from it it will be seen that *A. abyssinica* has unusually large sterile- and floriferous-bracts, apical buds crowded, suberect, and almost hidden by large imbricate bracts, the open flowers being much more laxly disposed.

Professor Millot states that the longest flower is 32 mm. (dry), and the longest pedicel on right is 45 mm. long. I am assured by Professor Millot that the note in the lower left corner of the sheet is in Lamarck's own handwriting, which eliminates any possibility of the material having been wrongly identified by someone else. The note reads: "Fleurs de l'Aloes d'Abyssinie. Elles sont jaunes. La hampe qui les porte est quelquefois à 3 rameaux."

This authentic material proves conclusively that Salm Dyck was entirely mistaken in his concept of *A. abyssinica*. His figure is of a form of *A. Camperi* Schweinf. and differs considerably from the Lamarck specimen.

Salm Dyck (1842) stated: "The distinguished Bruce in about the year 1777, gave the *seeds* of this plant (which seeds had been collected in Abyssinia) to the Royal Garden in Paris where it has been grown since that time." Against this, Lamarck stated, "This *plant* was *brought back* from Africa by Bruce."

Salm Dyck's figure was the first published of "*A. abyssinica*" and it has misled all subsequent workers up to the present day, including Berger (1908).

Berger's figure of "*A. abyssinica* Lam." depicts a form of *A. elegans* Tod. (see below), and not one of Berger's citations and synonyms can now be included under *A. abyssinica* Lam.

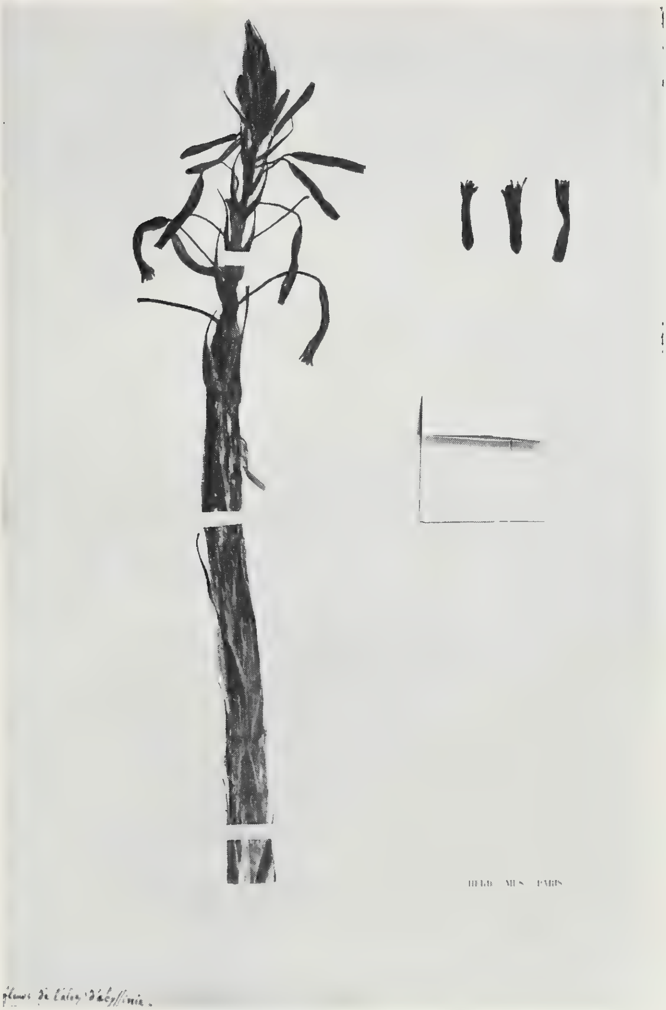

PLATE XXIX. *Aloe abyssinica* Lam.

Photograph of the specimen in the Lamarck Herbarium, Paris. Note in lower left corner, in Lamarck's handwriting, reads; "Fleurs de l'Aloes d'Abyssinie. Elles sont jaunes. La hampe qui les porte est quelquefois à 3 rameaux."

—By courtesy Professor J. Millot.

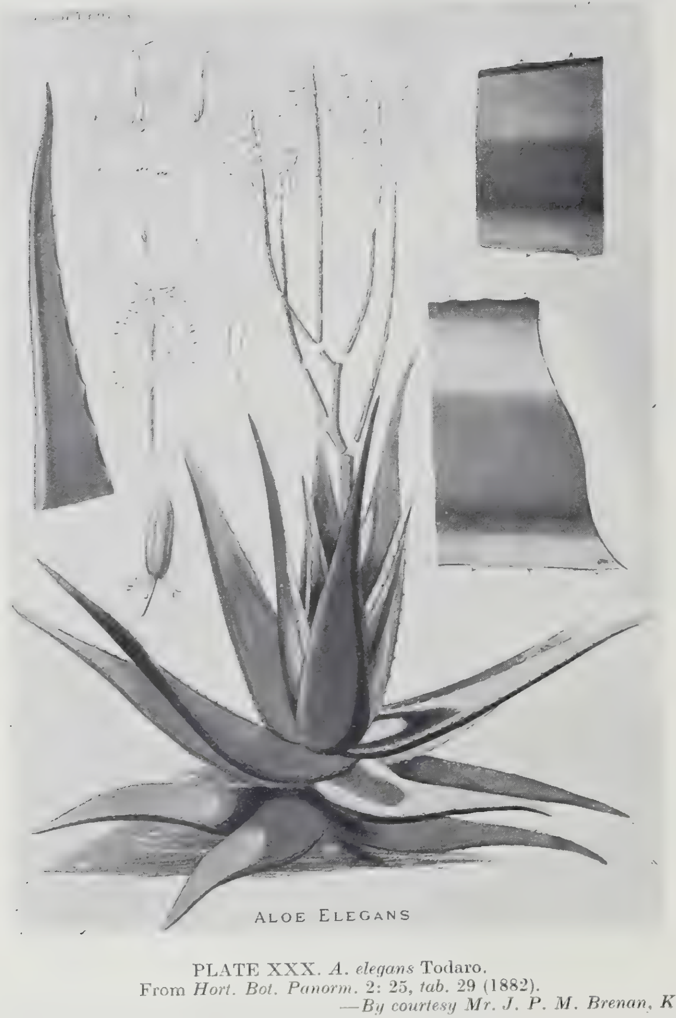

PLATE XXX. *A. elegans* Todaro.
From *Hort. Bot. Panorm.* 2: 25, *tab.* 29 (1882).
—*By courtesy Mr. J. P. M. Brenan, Kew.*

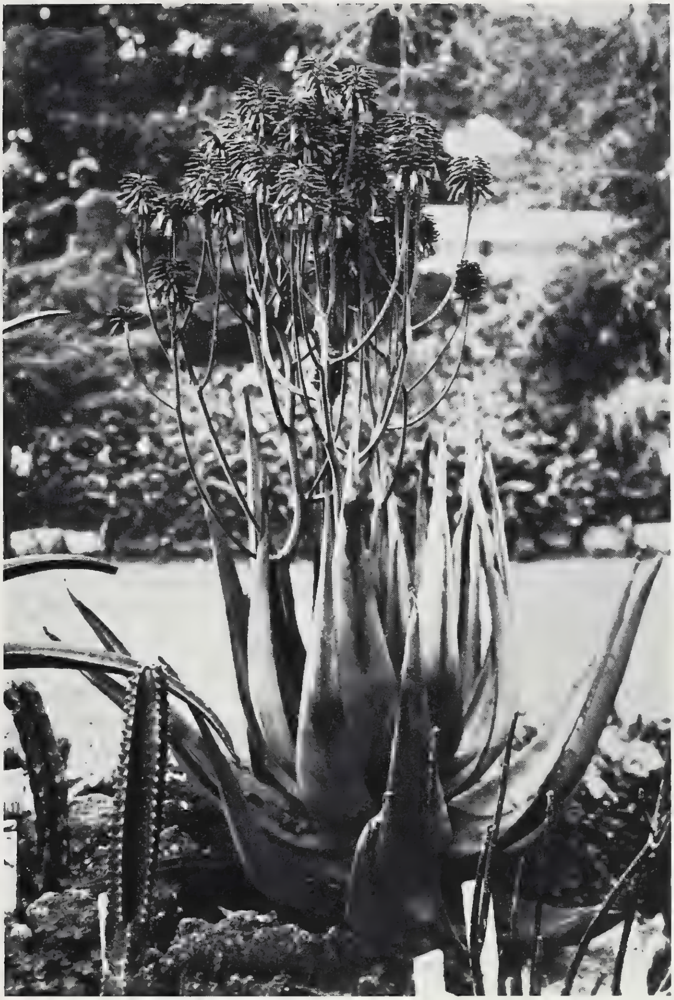

PLATE XXXI. *A. elegans* Tod. (=*A. aethiopica* (Schweinf.) Berger)
Photograph of the type plant of *A. aethiopica* (Schweinf.) Berger, cult. La Mortola,
fl. 20 Feb. 1899.

A description lacking in several characters, and based on Lamarck's description and on obvious characters of the Lamarck specimen would read as follows:

Aloe abyssinica Lam. in *Encycl. Méthod.* 1: 86 (1783).—*Non* Salm Dyck, *non* Roem. et Schult., *non* Kunth, *non* Baker, *non* Schweinfurth, *non* Hooker, *non* Berger.

Habit of growth unknown. *Leaves* in a rather open rosette, 75 cm. long, 10 cm. broad at base, thick, clear green; *upper surface* channelled; *lower surface* convex; whether unicoloured or spotted not known; *margins* armed with red teeth, size and distance apart unknown; *sap* orange-yellow, resinous, "quickly thickening into a dry reddish matter." *Inflorescence* 1 met. or more tall, simple or sometimes three-branched, with flowers disposed in a long somewhat lax spike; *raceme* cylindric-conical, 20 cm. long; buds suberect, crowded and partly obscured by large bracts, open flowers laxer, nutant to subpendulous. *Bracts* evidently large and fleshy, narrowly deltoid, about 20 mm. long. *Pedicels* up to 45 mm. long. *Perianth* yellow, 32 mm. or more long, apparently cylindric, "deeply cut into 6 parts" (*outer segments* free to the middle?). *Stamens* shortly exserted and grouped along one side of the perianth. (Plate XXIX.)

Until such time as plants agreeing with Lamarck's description and material can be re-discovered, it seems that *A. abyssinica* Lam. will remain a *Species non satis cognita*.

A. elegans Todaro

A. elegans Tod. was described and beautifully figured in *Hort. Bot. Panorm.* 2: 25, *t.* 29 (1882), but it does not appear to have been recognised again since then.

Berger in Engler *Pflanzenr.* Liliac.-Aloin. 237 (1908) not only wrongly identified *A. abyssinica* Lam. but he also wrongly placed *A. elegans* Tod. in synonymy under *A. abyssinica* Lam.

Todaro's *t.* 29 is reproduced herein (Plate XXX.), and from this figure it will be seen that one of the most striking characters of *A. elegans* is the racemes with the young buds spreading horizontally to slightly downwards.

Schweinfurth also did not recognise *A. elegans*, and he described this species as *A. vera* var. *aethiopica* in *Bull. Herb. Boiss.* 2: app. 2, 61 (1894).

Berger in Engler's *Bot. Jahrb.* 36: 60 (1905), and in *Pflanzenr.* 243, Fig. 94, (1908) described *A. aethiopica* (Schweinf.) Berger from a plant that flowered in La Mortola in February 1899. Material from Berger's type plant is in Kew, together with a photograph of the flowering plant. (Plate XXXI).

This material is the type of *Bot. Mag. t.* 7667 (1899) and that plate was prepared from Berger's photograph—but the species was wrongly named *A. Schweinfurthii* Bak. by Hooker.

This photograph was also used for the figure accompanying the text in *Gard. Chron.* 23: ser. 3, 197, Fig. 76 (1898) but the species was also wrongly named *A. Schweinfurthii* Bak.

I have photographed and collected the true *A. Schweinfurthii* Bak. at the type locality, Mt. Bangenze, Equatoria Province, Sudan, near the Congo border—see this *Journal* 20: 165 (1954). That species differs very considerably from Berger's *A. aethiopica.*

Berger gives no locality of origin for his plant, but if his photograph is compared with Todaro's *t.* 29 it will be seen that the plants are very similar in rosettes and kind of inflorescence while in both the buds are spreading horizontally to slightly downwards—an unusual character in Aloe.

In my view Berger's species is clearly conspecific with *A. elegans* Tod., and the latter being the earlier name has priority. Todaro states that his plants were raised from seeds collected by Schimper in Abyssinia, (which then included the present Eritrea and Ethiopia).

A. elegans Tod. occurs in considerable numbers over a wide area in Eritrea, and Tigre, Northern Ethiopia. It is abundant near Asmara (7500 ft); for 80 km. along the road towards Keren; southwards to Adi Ugri (6,200 ft.), Adi Kwale (6,500 ft.); not seen in the Mareb valley—which is the Eritrea-Tigre border; southwards to Adowa (6,100 ft.), Axum (6,300 ft.) and east of Adowa. East of Asmara the species abounds south of Nefasit in the broad Piana Dalla valley (5,300 ft.), thence southwards to Decamere (6,400 ft.), Saganeiti (6,900 ft.), Addingfom hill near the Gorge of Gua (6,700 ft.), Adi Caieh (7,700 ft.), on the Kohaito Plateau with *A. Camperi* Schweinf. and *A. percrassa* Tod. (8,200 ft.), and near Senafe (7,700 ft.). In Tigre, *A. elegans* occurs abundantly to Adigrat (7,700 ft.), southwards to Mekele (6,700 ft.) and to the foot of Amba Alaji (6,600 ft.), 55 km. south of Mekele and 355 km. south of Asmara, which is the furthest south that I saw it.

The species can now be more fully described from personal observations in Eritrea and Northern Ethiopia.

A. elegans Todaro in *Hort. Bot. Panorm.* 2: 25, *t.* 29 (1882).

A. Schweinfurthii Hook. f. in *Bot. Mag. t.* 7667 (1899) *non* Baker; Bak. ex Berger in *Gard. Chron.* 23: ser 3, 197, Fig. 76 (1898), *non* Baker in *Journ. Linn. Soc.* 18: 175 (1880).

A. aethiopica (Schweinf.) Berger in Engler *Bot. Jahrb.* 36: 60 (1905), in *Pflanzenr.* Liliac.-Aloin. 243 (1908).

A. vera var. *aethiopica* Schweinf. in *Bull. Herb. Boiss.* 2: app. 2, 61 (1894); Baker in Th. Dyer *Fl. Trop. Afr.* 7: 465 (1898).

A. abyssinica var. *Peacockii* Baker in *Journ. Linn. Soc.* 18: 175 (1880), in *Bot. Mag. t.* 6620 (1882)—*fide* Todaro; Baker in Th. Dyer *Fl. Trop. Afr.* 7: 468 (1898).

Description. *Plant* usually solitary, rarely dividing into 2—3 rosettes.

Stem none, or sometimes up to 20—30 cm. long in old specimens, decumbent.

Leaves 16—20, densely rosulate, (rosettes compact, averaging 60 cm. diam.) lanceolate-attenuate, 15—18 cm. broad at base, about 60 cm. long, 25 mm. thick, gradually narrowing to an obtuse shortly-dentate apex; *upper surface* grey-green, flat low down, slightly canaliculate upwards, without spots or markings; *lower surface* convex, similar in colour to upper surface; *margins* with reddish edge, armed with brownish-red teeth that are pungent, deltoid, 3—4 mm. long, 15—25 mm. distant, larger low down, smaller upwards. *Sap* dries reddish-brown.

Inflorescence a many-branched panicle 1 met. high, 2—4 simultaneously.

Peduncle basally plano-convex and 25 mm. broad, branched from about the middle with about 8 arcuate-ascending branches, the lowest sometimes with 1—2 branchlets.

Racemes conical when young becoming corymbose when flowers open, broadly cylindric, subcapitate, the terminal 8 cm. long 7 cm. diam. lateral a little shorter, densely flowered, youngest buds spreading horizontally to slightly downwards, open flowers nutant to subpendulous.

Bracts narrowly ovate-acuminate, about 8 mm. long, 2—3 mm. broad, thin, subscarious, 3—5-nerved.

Pedicels averaging 15 mm. long, compactly arcuate-ascending, nutant at apex.

Perianth yellow, orange or scarlet, cylindric, very slightly clavate, 25—30 mm. long, basally flat to very slightly rounded and shortly stipitate, 6 mm. diam. across the ovary, thence very slightly narrowed and trigonously indented, enlarging slightly from the middle to a wide open trigonous mouth; *outer segments* free for half their length, thinner at the margins, obscurely 3-nerved, the apices subacute, slightly spreading; *inner segments* free but dorsally adnate to the outer to the middle, broader than the outer, with 3 crowded nerves forming a keel the colour of the perianth, and with their apices more obtuse and more spreading than the outer.

Filaments pale lemon, the 3 inner narrower and lengthening before the 3 outer with their *anthers* in turn exserted 3 mm.

Stigma at length exserted 4 mm.

Ovary light green, 5 mm. long, 3 mm. diam. (Plates XXX—XXXIII)

MATERIAL: Cult. La Mortola, fl. 20 Feb. 1899! (type of *Bot. Mag. t.* 7667) (K).

Eritrea: Between Adi Ugri and Adi Kwale, 6,000 ft., c. 15° 22′ N., 38° 50′ E., 18 Apr. 1956, Reynolds 8092 (PRE, EA, K).

Northern Ethiopia, Tigre: 55 km. S. of Mekele at foot of Amba Alaji, 6,600 ft., c. 13° 08′ N., 39° 29′ E., 27 Apr. 1956, yellow flowers, Reynolds 8110 (PRE, K); red flowers, Reynolds 8111, (PRE).

Although occasional plants were found in flower in April, the main flowering time is August—September, after the rains.

With buds spreading horizontally to slightly downwards, *A. elegans* is allied to *A. Chabaudii* Schonl. (Nyasaland, Northern and Southern Rhodesia, Transvaal), and *A. mzimbana* Christian (Northern Rhodesia, Nyasaland).

A. Camperi Schweinfurth

A. Camperi Schweinfurth was described in *Bull. Herb. Boiss.* 2: app. 2, 67 (1894) from the Great Valley above Ghinda, Eritrea, 1,400 met., Schweinfurth 514a, coll. 1891. Schweinfurth also included: Asmara, 2,400 met. n. 605, coll. 1891; Arbaschiko, 1,600 met., n. 668, coll. 1891; Gheleb, 1,700 met., n. 1074, 1234, coll. 1891; Acrur, 1,900 met., 1342, 1306, coll. 1892, all in Eritrea.

Schweinfurth stated: "Grows at all (above) mentioned places in association with *A. abyssinica* Lam., but more singly and not in communities. It cannot be distinguished by its flowers from *A. abyssinica* Lam.. but differs in its broader shorter leaves not so recurved at the apex. . ."

Schweinfurth had obviously followed Salm Dyck's description and figure of "*A. abyssinica* Lam.," which, as has been shown above, was entirely incorrect. He and others have endeavoured to make two species from forms of one shrubby species of Aloe found in considerable numbers from the valley above Ghinda to Nefasit, up the mountains to Asmara, and elsewhere in Eritrea.

Another species now becomes involved, namely *A. eru* Berger. Berger had wrongly identified *A. abyssinica* Lam.,—his concept being a form of *A. elegans* Tod. He also wrongly placed *A. Camperi* Schweinf. in synonymy under his concept of *A. abyssinica* Lam. (i.e. *A. elegans* Tod.) which added still more to the confusion.

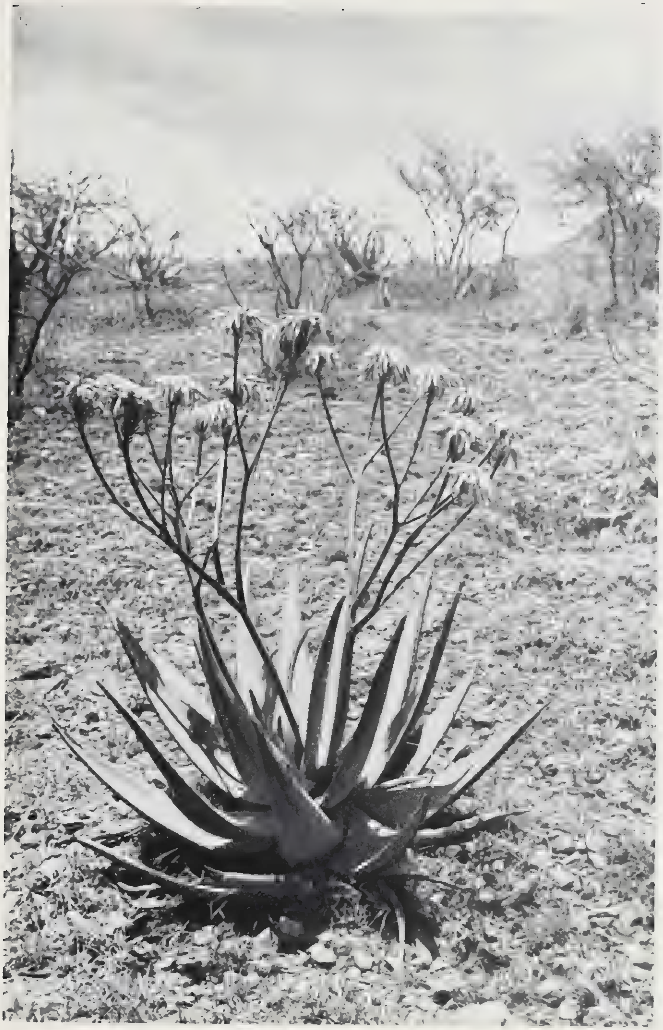

PLATE XXXII. *A. elegans* Tod.
Plant fl. 26 April 1956, at northern foot of Amba Alaji, 55 km. south of Mekele, Tigre, Northern Ethiopia. Alt. 2,000 met. Height 90 cm.

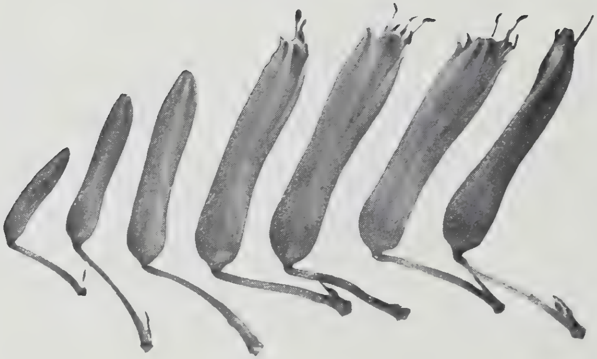

Fig. 1.

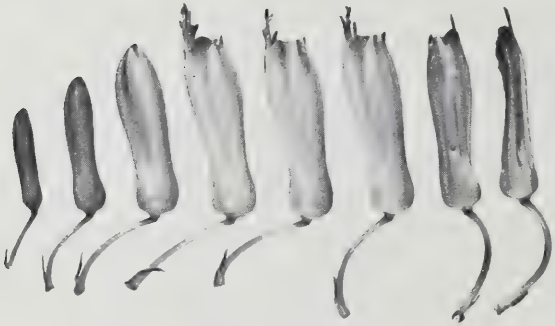

Fig. 2.

PLATE XXXIII. *A. elegans* Tod.

Fig. 1.—Flowers 1/1 from a plant at northern foot of Amba Alaji, 55 km. south of Mekele, Tigre, Ethiopia.

Fig. 2.—Flowers 1/1 from a plant between Adi Kwale and Adi Ugri, Eritrea.

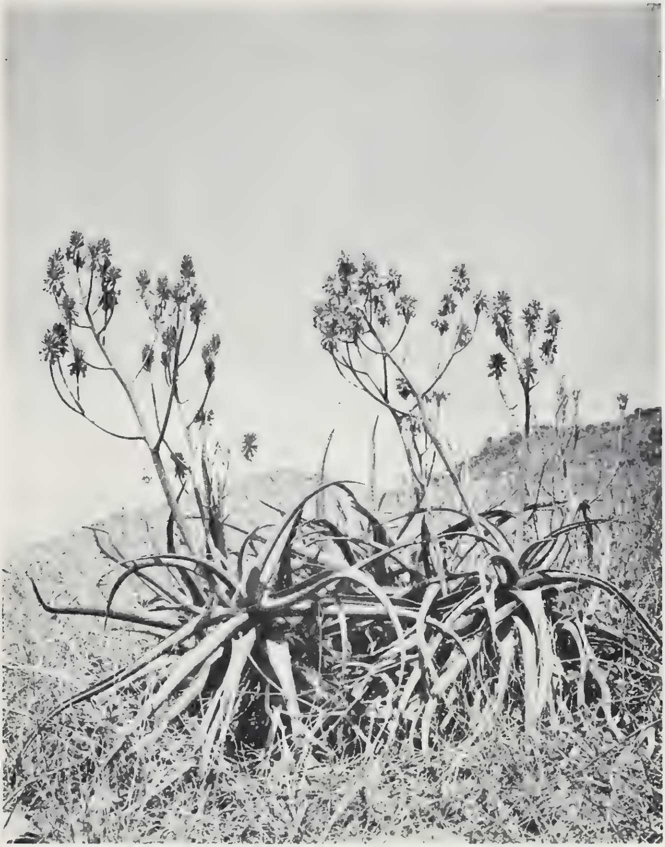

PLATE XXXIV. *A. Camperi* Schweinfurth (=*A. eru* Berger).
Plant in the great valley above Ghinda, near Nefasit, Eritrea. c. 15° 23′ N., 39° 04′ E.
Alt. 1,700 met., fl. 13 April 1956.

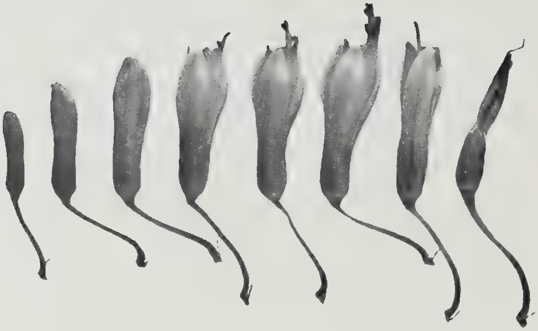

Fig. 1.

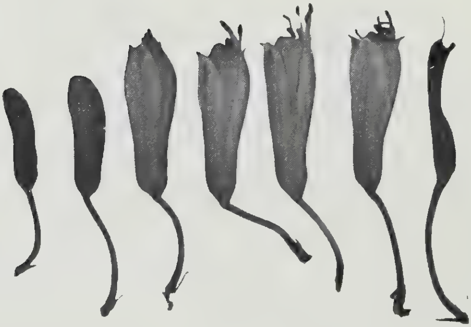

Fig. 2.

PLATE XXXV. *A. Camperi* Schweinfurth (= *A. eru* Berger)
Fig. 1.—Flowers 1/1 from a plant near Nefasit, Eritrea.
Fig. 2.—Flowers 1/1 from a plant 6 km. east of Asmara, Eritrea.

Berger founded his *A. eru* on Schweinfurth's n. 514 from the Great Valley above Ghinda, and he also cited the identical material from Asmara, Gheleb and Acrur that Schweinfurth had cited for his *A. Camperi*.

In April 1956, when travelling in Eritrea, I specially visited as many of Schweinfurth's localities as I could reach. I found the shrubby species hitherto so well known as *A. eru* Berger, in considerable numbers in the valley between Ghinda and Nefasit (the first place where travellers coming up from the coast would see it) and especially on the mountains up to Asmara at 7,600 ft.

It is now clear that *A. abyssinica* Schweinf. *non* Lam., *A. Camperi* Schweinf., and *A. eru* Berger are merely forms of one species from the same locality. *A. Camperi* being the earlier name has priority over *A. eru* which should now be reduced to synonymy.

A. Camperi occurs in considerable numbers in many parts of Eritrea, from Meschillit Pass north-east of Keren in the north to the Ethiopian border in the south. I found it in the broad Piana Dalla valley south of Nefasit (5,300 ft.), near Decamere (6,400 ft.), Saganeiti (6,900 ft.), Addingfom Hill near the Gua Gorge (6,800 ft.), Adi Caieh (7,700 ft.), on the Kohaito Plateau with *A. percrassa* Tod., and *A. elegans* Tod. (8,300 ft.), and near Senafe (7,700 ft.).

In Ethiopia, *A. Camperi* was found in numbers at the northern foot of Amba Alaji (6,700 ft.), near Alamata (4,800 ft.) and Cobbo (4,700 ft.), in the Rift Valley, Tigre Province. In Wollo Province, the species occurs abundantly near Waldia (6,000 ft.), and as far south as near Dessie.

A. Camperi is a variable species, weaker forms occurring at lower drier altitudes (4,600 ft.), and more robust forms from 6,000—8,300 feet. Stems vary in length. Leaves vary in length and width and occur with or without spots. Racemes also vary from shorter and denser to longer and laxer. Flowers vary in length and shape, but are invariably clavate, and average 20 mm. in length.

The following description is based on personal observations in the valley above Ghinda, near Asmara, and elsewhere in Eritrea:

A. Camperi Schweinfurth in *Bull. Herb. Boiss.* 2: app. 2, 67 (1894).

A. abyssinica (*non* Lamarck) Salm Dyck *Cat. rais.* 25 (1817), *Monogr. gen. Al.* ser. 18, fig. 1, (1842); Roem. et Schult. *Syst. veg.* 7: 695 (1829); Kunth *Enum. pl.* 521 (1843); Baker in *Journ. Linn. Soc.* 18: 174 (1880), in Th. Dyer *Fl. Trop. Afr.* 7: 467 (1898); Schweinfurth in *Bull. Herb. Boiss* 2: app. 2, 66 et 110 (1894); Hooker in *Bot. Mag. t.* 7712 (1900). (*Note: A. abyssinica* Berger in Engler *Pflanzenr.* Liliac.-Aloin 237 (1908) excl. part syn., is a form of *A. elegans* Tod.).

A. eru Berger in Engler *Pfianzenr.* Liliac.-Aloin 249 (1908).

Description. *Plant* shrubby, branching from base and sometimes forming groups 1—2 met. across.

Stem usually 50 cm. long, 6 cm. diam., sometimes up to 1 met. long, 9—10 cm. diam., erect, divergent or decumbent, the apical 10—20 cm. densely foliate.

Leaves 12—16, rosulate, averaging 50—60 cm. long, 8—12 cm. broad at base, tapering to the apex, basally sheathing, recurved and forming open rosettes; *upper surface* dark green, canaliculate, unspotted or sometimes with a few dull white lenticular spots; *lower surface* convex, deep green, with or without numerous elongated lenticular white spots; *margins* with reddish edge, armed with deltoid pungent brownish-red teeth averaging 3—5 mm. long, 10—20 mm. distant, more crowded near base, more distant upwards.

Inflorescence a branched panicle 70—100 cm. high, usually 2—3 simultaneously.

Peduncle basally plano-convex and 15—20 mm. broad, brown with a bloom, 6—8-branched from about the middle, lowest branches sometimes with 1—2 branchlets.

Racemes densely flowered, the pedicellate portion 6—9 cm. long, 6—7 cm. diam., youngest buds suberect, scarlet, sometimes greyish-green tipped, older buds spreading, open flowers turning orange to yellow, subpendulous.

Bracts very small, deltoid, 2 mm. long, 2 mm. broad at base, dirty white, 5-nerved.

Pedicels 12—18 mm. long, 14 mm. the average.

Perianth orange to yellow, cylindric-clavate, averaging 20—22 mm. long, basally obconic and shortly stipitate, 5 mm. diam. across the ovary, clavate upwards, the mouth wide open, trigonal; *outer segments* free for one-third their length (about 7 mm.), obscurely 3-nerved, apices subacute, slightly spreading; *inner segments* free but dorsally adnate to the outer for two-thirds their length, thinner at the margins, the apices more obtuse and more spreading than the outer.

Filaments lemon, the 3 inner narrower and lengthening before the 3 outer with their *anthers* in turn exserted 2—3 mm. *Stigma* at length exserted 3—4 mm. *Ovary* light green, averaging 5 mm. long, 2 mm. diam. (Plates XXXIV—XXXV)

Native Name: *Erreh* in Eritrea, *Iret* in Ethiopia.

Material. *Eritrea:* Gheleb, 1,900 met., 3 April 1891, Schweinfurth 1234! 1430! 1796! (K); near Acrur, 1,900 met., 1—6 April 1892, Schweinfurth 1350! (K), 25—30 April 1892, Schweinfurth 1797! (K). 6 km. east of Asmara, 2,250 met., 12 April 1956, Reynolds 8036! (PRE, K). In valley above Ghinda near Nefasit, 1,700 met., c. 15° 23′ N., 39° 04′ E., 13 April 1956, Reynolds 8051! (PRE, K, EA). On the Kohaito Plateau 13 km. south of Adi Caieh, 2,730 met., 15 April 1956, Reynolds 8071! (PRE, K).

Ethiopia, Wollo Prov.: 20 km. south of Waldia, 100 km. north of Dessie, 1,710 met., 25 April 1956, Reynolds 8105! (PRE, K, EA).

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